



# Spaceport News

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John F. Kennedy Space Center

## Jim Kennedy named KSC Director

William F. Readdy, Associate Administrator for Space Flight at NASA Headquarters in Washington, named James W. Kennedy as the new Director of Kennedy Space Center June 26. Kennedy has served as KSC's Deputy Director since November 2002.

"The programs we support are so profoundly important," said Kennedy. "The Space Shuttle processing for launching and landing is so critical and we do it so well at this Center. I want to work with you to continue to make it the best that it can be as we attempt to get into the return to flight. I will give it my all to make sure you have the resources to do what we need to do collectively as a Center to return to flight safely."

Kennedy will succeed Roy Bridges Jr., who was appointed to lead NASA's Langley Research Center, Hampton, Va., June 13.

"When asked, I gave Jim my strongest unqualified support for succeeding me in this job," said

Bridges. "I think he will do a wonderful job of being my successor here. You can certainly count on me and Benita (Bridges' wife), from our new place, to be boosters of this team at KSC as well as the bigger One NASA team."

Prior to his assignment to KSC in 2002, Kennedy was deputy director of NASA's George C. Marshall Space Flight Center in Huntsville, Ala.

Kennedy also served as project manager for major initiatives, such as the X-34 and the DC-XA, and he led the One NASA effort to help make the Agency more effective and efficient by encouraging teamwork across all field centers.

In early 1996, he was the manager for Marshall's Space Shuttle Projects Resident Office at KSC. Kennedy returned to Marshall when he received a Senior Executive Service appointment in September 1996 and was named manager of the Solid Rocket Booster Project.



Future KSC Director Jim Kennedy (left) shakes hands with current Director Roy Bridges Jr. following the announcement at the Training Auditorium. Kennedy will assume his new post Aug. 10.

In 1998, he was selected as the Deputy Director of Science and Engineering, where he was responsible for establishing and maintaining a nationally recognized research and development capability in space research and technology. One year later, he became the Director of Engineering.

"Along with his impeccable credentials, Jim brings stability to KSC at a time when we need it," Readdy said making the announcement. "As we prepare

to implement the findings of the Columbia Accident Investigation Board, Jim's knowledge of the Space Shuttle and his leadership abilities are essential in making our 'Return to Flight' effort a success."

Kennedy first joined NASA in 1968 in the Aerospace Engineering Cooperative Education program at KSC. He earned a bachelor's degree in mechanical engineering from Auburn University in 1972. After being

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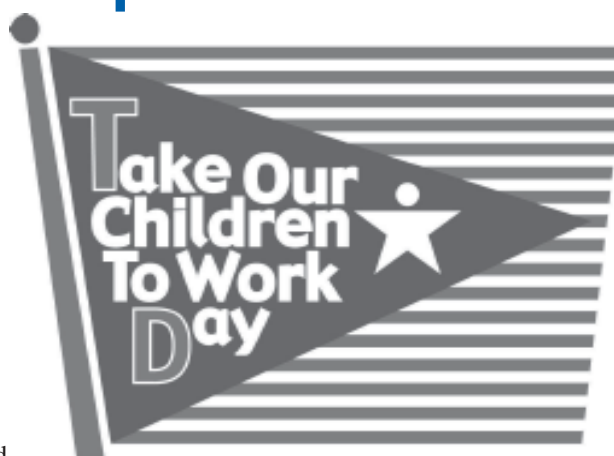
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## Special events planned for children

On July 24, KSC will celebrate Take Our Children To Work Day. This will be the 11<sup>th</sup> year the Center will open its doors for the children of KSC employees, who are invited to bring a son or daughter, grandchild, niece or nephew to work with them to share in the work experience.

This special day targets children from 9 to 15 years old. It encourages children to set goals for their future and to build on these goals during their years in school.

Several exciting educational programs are being planned.



Children must enter through Gates 1, 2, 2B, 2C, 3, and 4. Program hours are from 7 a.m. to 4:30 p.m. Access will not be allowed before 7

a.m.

All children must wear their badge and be with a badged employee at all times. The sponsor is responsible for the children they bring – the child may go with another person to another work

site, but ultimate responsibility remains with the sponsor.

Children may not be taken

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# Storage of Columbia debris to be determined

After the Apollo 1 tragedy occurred, the launch pad was used for another launch and then "abandoned in place" with a memorial plaque. Following the Challenger accident investigation, the debris was placed in two Minuteman missile silos and adjacent underground equipment rooms at abandoned Launch Complexes 31 and 32 at Cape Canaveral Air Force Station (CCAFS).

Now that Columbia debris reconstruction efforts at Kennedy Space Center are complete and the Reconstruction Team has issued their report to NASA and the Columbia Accident Investigation Board, the questions on many minds are where will the debris be stored? And will the debris be offered to organizations outside NASA for scientific study and research?

"Several facilities are being considered for storage purposes," said Scott Thurston, Columbia Preservation Team lead with NASA.



These include using a section of the current reconstruction hangar, the Vehicle Assembly Building (VAB) B Tower, the Spacecraft Assembly and Encapsulation Facility, an off-site lease building, or Complexes 31 and 32 silos at CCAFS. "The reconstruction hangar and the VAB are the most likely," said Thurston.

In order to determine how best to store the debris, the Columbia Preservation Team issued a "Request for Information" (RFI) on May 9, with responses due June 6. The RFI was sent to scientific, academic and governmental organizations.

Columbia debris storage is being considered for the VAB B Tower, an off-site lease building, and other facilities.

According to Steve Parker, NASA contract specialist, 15 letters of interest ranging from private companies, aerospace consortiums and public universities have been received.

Proposals included performing studies on pieces of the debris using various failure analyses methods; curation and management of debris; using the debris for teaching failure analysis techniques; and studies of debris trajectory data.

Also proposed were studies of welded, brazed or soldered joints; studies of effects of thermal cycling and zero gravity over time; and creating a Colum-

bia Material and Analysis Museum.

"Through the efforts of outside researchers, we stand to learn a great deal regarding hypersonic and thermodynamic properties and their affects on spacecraft parts. This will greatly assist in the design and flight safety of future spacecraft," said Mike Leinbach, KSC Shuttle Launch Director.

"These letters of interest are being reviewed for practicality and feasibility," said Parker. "Some of the proposals are seeking money to perform the research, which must be factored against what we already know from the accident investigation."

The Columbia Preservation Team will present options and recommendations to KSC senior management later this summer.

To honor Columbia, *Spaceport News* will publish a 12-page color commemorative issue July 25. The issue will contain stories highlighting debris workers' experiences in the field, the efforts of the Reconstruction Team, the history of the first Space Shuttle and more.

## Shuttle program manager announces personnel changes

Space Shuttle Program Manager Bill Parsons recently announced several key leadership changes within the office as it reorganizes and evolves following the Columbia accident.

"This is a critical time for the Agency and the shuttle program and I believe these changes and additions to my staff prepares us to return to flight as soon as possible and, most importantly, as safely as possible," said Parsons.

N. Wayne Hale Jr. is now Acting Deputy Manager, Space Shuttle Program. He will return to the Johnson Space Center from the Kennedy Space Center where he has served as Manager, Launch Integration, since February.

Hale joined NASA JSC in 1978 and has served in several senior technical and managerial

positions. He began his managerial career in 1985 as Head, Communications Systems Section. From 1988 to 2002 he served as a flight director including the Ascent and Entry Flight Director for 28 Space Shuttle flights.

Steve M. Poulos, Jr., becomes Acting Manager, Orbiter Project Office at JSC. He joins the shuttle program from the Engineering Directorate where he most recently was Chief, Crew and Thermal Systems Division.

Poulos joined NASA JSC in 1989 and has held positions including Deputy Chief, Extravehicular Activity (EVA) Equipment Branch, and Chief, EVA and Spacesuit Systems Branch in the Engineering Directorate; Deputy Manager, EVA Project Office; and Deputy Manager, Program Integration

Office, International Space Station Program.

Edward J. Mango becomes Deputy Manager, Orbiter Project Office. He has been the technical assistant to the Space Shuttle Program Manager on detail from KSC.

Mango joined NASA at KSC in 1986 and has held positions that include Lead Project Engineer for the External Tank and Solid Rocket Motors; Lead Project Engineer for Atlantis during the Shuttle-Mir Program; Shuttle Project Engineer; and Shuttle Launch Manager. Most recently he served as the Recovery Director for the Columbia debris recovery effort in East Texas.

John P. Shannon is named Acting Manager, Flight Operations and Integration. Most recently, he served as Lead Flight

Director on Discovery's STS-102 mission in March 2001. Following Columbia's accident, Shannon served as the Deputy Director of the Columbia Task Force that served as the interface between NASA and the Columbia Accident Investigation Board.

Shannon joined NASA JSC in 1987 and has served in several senior technical and managerial positions. He began his managerial career in 1992 as Head, Guidance and Control Systems Section. From 1993 to 2003 he served as a flight director, including Ascent and Entry Flight Director for 11 Space Shuttle flights.

John F. Muratore is named Manager, Systems Integration Office. He most recently was Assistant to the Director of Engineering at JSC. He joined the JSC staff in 1983.



# Education Office give faculty and students tour

Since the Education Office's summer programs went into full force May 19, participants have taken advantage of all Kennedy Space Center has to offer.

On June 6, Graduate Student Researchers Program (GSRP), NASA Faculty Fellows Program (NFFP) and the National Research Council Associate were chosen by KSC. This included an introduction to KSC's senior management staff. Each person also had a chance to mention their educational institution, research project and which directorate they'll be supporting while at KSC.

"The GSRP is a grant for students working to get a masters or a PhD degree. The award consists of \$24K a year for up to three years," explained Eduardo Lopez Del Castillo, program management specialist. "Of the nine selections made this year, only one was a returning student. The students are assigned a research advisor at the university and a research advisor at Kennedy."

"NFFP consists of a 10 week grant awarded for faculty members to come and help us with our applied and basic research projects during the

summer," he said. Faculty Fellows presented their Midterm Presentations July 2 in the Education Conference Room at KSCVC as well.

All program participants became familiar with the Center. On June 11, more than 100 students visited key KSC facilities, the Shuttle Launch Pads and more. At least two NASA and contractor volunteers greeted guests and broke them into smaller groups to meet the tour guidelines established by security personnel.

Thirty Space flight and Life Sciences Training Program (SLSTP) students toured the Solid Rocket Booster Retrieval Ships June 25. Lopez Del Castillo explained that the success of these tours was made possible by the volunteers: Cassandra Black, Karroll Purer, Laurel Lichtenberger, Heriberto Soto, Carlos Estrada, Margaret Dutczak, Less Boatright, David Rainer, Tom Purer and Mark Femminino.

The Pipelining and Networking Session, June 23, offered an afternoon of useful learning opportunities for about 150 students. While at the KSC Visitor Complex's Debus Center,



Capt. Bren Wade explains procedures to 30 students who toured the Solid Rocket Booster retrieval ships June 25.

attendees mingled with colleagues from different education programs. The main objective of the event was to provide information about KSC's education programs at KSC that are open to any student that is a U.S. citizen, attends a university in the U.S.,

icebreaker exercise.

"Students and faculty were assigned to sit at tables with students not participating in the same program, then asked to briefly describe their program to everyone at the table," explained Cassandra Black, program management specialist. "Volunteers from each table were asked to introduce a student or faculty and talk about their program." Education Specialists, representing various programs, also introduced themselves to the crowd.

"It is essential that we inspire the students and faculty so they will consider permanent employment with KSC and KSC's contractor workforce," said Black.

Even more extraordinary activities are scheduled for the summer. For example, Education Program participants will attend a workshop and Mentors/Colleagues appreciation luncheon, July 9 at the Cocoa Beach Holiday Inn. Three speakers will give advice on how to successfully strive for success.



Faculty and students in the KSC Education Program tour the VAB

Puerto Rico or the Virgin Islands.

Pam Biegert, Education Programs and University Research Division chief, welcomed the group and then introduced an



## Employees of the Month

July Employees of the Month, front row from left: Dorothy Davis, Spaceport Engineering & Technology; Jennifer Wahlberg, ISS/Payloads Processing; Stacie Grega, Workforce & Diversity Management. Back row from left: Nathan Wood, ELV & Payload Carriers Program; John Peters, Shuttle Processing; and Kim Myrick, Spaceport Services.

## Visitor Complex offers summer deal

Through an arrangement with Delaware North Park Services, all KSC employees will get free admission to the Visitor Complex by showing their badge at the ticket booth. This offer includes all exhibits, IMAX films and the LC39 and Apollo/Saturn V bus tour.

Also included is admission to the Astronaut Hall of Fame, which is now part of the KSC Maximum Access visitor experience. Additionally, up to four accompanying guests are entitled to 50 percent off the Maximum Access Pass, a savings of \$66 for a group of four adults. The program lasts through Labor Day and is a great chance to show your family how you are proud to be part of the KSC team.



# NASCAR group visits KSC



Clockwise: Above, Winston Cup drivers (from left) Jimmie Johnson, Ryan Newman and Dale Jarrett visited the SSPF during a tour of KSC July 2. Top right, Newman enters the Shuttle Endeavour. Jarrett (left) and Johnson sit behind the controls of Endeavour.



## EVENTSÖ (Continued from page 1)

to any work area requiring a controlled access badge. Personnel working in these areas, which include the Vertical Assembly Building, Orbiter Processing Facility, Launch Control Center, Columbia Reconstruction Hangar, Operations and Checkout Building, and Space Station Processing Facility, may arrange for another person to take their child to an approved area.

The Federal Women's Program Working group members will issue badges to children of NASA employees July 21, 22, and 23 from 10 a.m. to 2 p.m. in the KSC Headquarters Building and Operations Support Building Lobbies. Peggy Parrish will issue badges to NASA employees at CCAFS on the same dates and times. Parrish is located at the Hangar I Annex and she can be

reached at 476-4000.

Contractor employees should contact their public affairs office or human resources office to obtain badges and determine the level of participation available to them, as not all contractors are participating.

Among special events planned for the day:

From 9 a.m. to 12 p.m. at the KSC Headquarters Building, fingerprinting will be available in the Lobby and KSC Security will have several displays at the SW Corner of the parking lot. Displays will include Emergency Response Vehicles, SWAT, and K-9.

Parents and children can take advantage of the KSC Visitor Complex Summer Special. By showing their badge at the ticket booth, employees will have free admission to the Visitor Complex and up to four accompanying

guests are entitled to 50 percent off the Maximum Access Pass. This offer includes all exhibits, IMAX films and the LC-39 and Apollo Saturn V bus tour.

Also included is admission to their newest attraction, the Astronaut Hall of Fame. For those that just want to visit the Astronaut Hall of Fame, a special price ticket of \$5 per person will be available for this day and can be purchased at the facility. Children will really enjoy this new attraction with several hands-on activities and simulators. Astronaut Hall of Fame is located on SR 405 approximately five miles west of the Visitor Complex.

A new Education and Career Fair is planned from 1:00 p.m. to 3:30 p.m. at the Debus Conference Facility at the Visitor Complex. There will be several booths and exhibits on careers

and student programs and a panel session on different engineering disciplines will be featured. Members of the Exploration Station staff plan two science demonstrations.

For children of NASA employees, a short program is planned at the IMAX 2 Theater at the KSC Visitor Complex at 8 a.m. If there are any individuals who require a sign language interpreter, please contact Debbie Houston at 867-6923 no later than July 15.

For all activities at the Visitor Complex, participants should remember to arrive early to go through the security checks. Sharp objects, large backpacks and coolers are not allowed.

On CCAFS, the Air Force Space Museum, Lighthouse, and cafeteria will be open. Please note, this is subject to change in the event of a launch operation.

# Fleet of 'American fuel' vehicles used at KSC

A growing number of Government Services Administration fleet vehicles at KSC are Alternative Fuel Vehicles (AFV), but it is up to you to utilize these vehicles and to operate them on an 'American fuel,' including natural gas, ethanol and biodiesel. With an annual petroleum consumption of nearly 1 million gallons, KSC can displace a significant amount of imported fuel and at the same time reduce pollutant emissions.

Over half of the gasoline and diesel we burn in our vehicles comes from overseas. AFVs operate on domestically produced fuels and have lower emissions than gasoline and diesel.

Natural gas, which is mainly methane, has the lowest emissions of any current fuel. Currently there are about 100 natural gas vehicles at KSC. Some are dedicated, meaning they only operate on natural gas, but most are bi-fuel, meaning that they can operate on either gasoline or natural gas.

You have the choice to use the natural gas rather than the gasoline in these bi-fuel vehicles. Natural gas has an octane rating of 120, emits approximately 80 percent less pollutants, is cheaper, and in many ways safer, than gasoline. Natural gas is non-

toxic, lighter than air and carried in very strong fuel tanks.

Ethanol and biodiesel are considered "renewable" because they are made from biomass (plants). Ethanol is an alcohol made primarily from corn. It is sold as E85 which is a blend of 85 percent ethanol and 15 percent gasoline.

This makes up at least 85 percent of the fuel domestically produced, and since the corn actually absorbs CO<sub>2</sub> during growth, it has excellent greenhouse gas reduction compared to gasoline. E85 has an octane rating of 100, emits approximately 20 percent less pollutants but provides 5-15 percent fewer miles per gallon than gasoline.

There about 300 E85 vehicles at KSC and can be identified by an "ethanol fuel" sticker on the inside of the gas cap door.

Biodiesel is made from vegetable oil, typically soybean. Its use in diesel fueled vehicles is growing rapidly because it improves the cetane rating and lubricity over conventional diesel. Most commonly biodiesel is sold as a 20 percent blend with petroleum diesel, called B20, because at that concentration it is a "drop-in replacement" for any diesel vehicle.

At only 20 percent concentration, it significantly reduces emissions, smoke and even odor.

B20 is currently available at the Citgo station behind the Headquarters building, so capitalize on its benefits for your personal diesel vehicle as well. The construction you may have noticed at the Citgo station is to add a fueling island specifically for E85. Natural gas is currently available at M6-689, the old GSA motor pool.

Pricewise, natural gas is cheaper than gasoline, while E85 and B20 cost more. It is impor-

tant to remember: Utilizing American fuels is not about saving money, it is about reducing our nation's dependence on imported petroleum and reducing pollution.

If you have any question or concern using Natural gas, E85 or B20 please call NASA Transportation at 867-3420, or GSA at 867-4906 for assistance.

Honda's natural gas Civic GX has the lowest emissions of any production vehicle on Earth. KSC just added five of the Hondas to the fleet of approximately 100 natural gas vehicles.



Honda's natural gas Civic GX has the lowest emissions of any production vehicle on Earth. KSC recently added these five to the fleet of approximately 100 natural gas vehicles. Natural gas is currently available at M6-689, the old GSA motor pool.

## New flags in VAB pay tribute to military

Two United Space Alliance (USA) fixed crane technicians, Brent Worlow and Bill Taylor, came up with the idea of installing the Armed Forces flags to pay tribute to the members of the NASA and contractor families who have served, or are currently serving, in the Armed Forces.

The two employees purchased the flags with their own money and requested permission to install them in the VAB Transfer Aisle. Permission was obtained from NASA, and a NASA flag protocol officer was consulted on the proper order of the flag display. The flags were framed by the Launch Equipment Shop and installed by the USA Mobile Cranes Shop.



New U.S. military flags on display in the VAB, from left, include branches of the Army, Marines, Navy, Air Force, Coast Guard, and Prisoners Of War-Missing In Action

## July Health Education Program Offered

Exercise has something for everyone. Physical activity can bring us better health, a longer life, a trimmer appearance, a brighter outlook on life and much more.

The benefits of life-long activity make an impressive list, which is growing longer as new discoveries are made. Discover what exercise can do for you physically, mentally, emotionally, psychologically and socially.

Packets will be available at all medical facilities in July and upon request to Carol Roth, 867-3414, or e-mail Roth-1, Carol.



# Shuttle engineer mentors winning team

The Merritt Island Merry-makers, four sixth-grade girls from Tropical Elementary, swept the top three prizes in the Great Toy Challenge held June 21 in Northhampton, Mass. The group's "Wet Your Pants" game won best in their category (Get Out and Play outdoor games and toys), as well as the Challenge Choice Award which was decided by balloting from all the children attending the event.

Troy Heron, an orbiter logistics engineer in the Shuttle Processing Directorate, mentored the group to prepare for event (see June 13 *Spaceport News*). The toy and game-design competition was created by the Sally Ride Science Club and Smith College to encourage students' interest in engineering and science.

The girls also won the grand prize, a week at Space Camp in Huntsville, Ala. Heron found the mentoring experience very rewarding and would recommend it to everybody.

"This was an outstanding result of the hard work that the young ladies have put in since last October," said Heron. "The team and our toy were featured on ABC's *Good Morning America* recently in a segment. They set our toy up on the sidewalk outside the studios in New York and actually played it."

The three top TOYchallenge designs were selected from 243 entries submitted by teams of children in grades five through eight. The toys and games were evaluated on originality, creativity, engineering elegance, feasibility, communication and team participation.



The Merritt Island Merry-makers won first place at the Great Toy Challenge, a national engineering and science fair. The group received ribbons from Astronaut Hall of Fame member Sally Ride and include, from left, Megan Heron, Natalie Edinger, Sara Jones and Jamie Dodich.

"It was inspiring to see how these girls and boys embraced the challenge to engineer an original toy," said Sally Ride. "The lessons they've learned over the course of TOY Challenge, especially those regarding

team work, the design process, the mechanics of developing a prototype and, most importantly, the fact that science and engineering are just plain fun, are invaluable to their academic and professional futures."

## Five schools in KSC district chosen for Explorer program

NASA's new education initiative, the NASA Explorer Schools Program, was launched June 30 during the National Educational Computing Conference (NECC 2003) in Seattle. Dr. Adena Williams Loston, NASA associate administrator for education, and astronaut Don Pettit formally announced the first 50 competitively selected NASA Explorer Schools.

Nearly 1,000 educators, policy makers and educational technology industry representatives, including education representatives from Kennedy Space Center, were present at the conference. The innovative program will send the nation's science and mathematics teachers "back to school" at NASA

Centers during the summer.

Among the 50 Explorer School Teams selected from 30 states, five schools were from Kennedy Space Center's district that includes Florida and Georgia. The schools are Carol City Elementary School, Opa Locka, Fla.; Stewart Magnet Middle School, Tampa; Oscar Patterson Elementary School, Panama City, Fla.; Howard W. Bishop, Gainesville, Fla.; and Bunche Middle School, Atlanta, Ga.

During the commitment period, NASA KSC will invite teachers from the selected schools to the space center to acquire new teaching resources and technology tools, using NASA's unique content, experts and other resources, to help

make learning science, mathematics and technology more appealing to students. The program is directed specifically at students in grades five through eight.

"At NASA, we feel compelled to act, to implement proactive and innovative approaches, such as the NASA Explorer Schools Program, to help stem the decline in the number of young people pursuing study of science, technology, engineering and math disciplines," said Loston, who visited KSC in June.

"If we can help in ways unique to NASA's mission, to hold students' interest in math and science through the middle school years, we would anticipate a marked increase in

students entering related careers. The nation's continued leadership in science and technology depends on the efforts of NASA and others," she said.

The new initiative is sponsored by the NASA Education Enterprise in collaboration with the National Science Teachers Association (NSTA). It establishes a three-year partnership between NASA and 50 NASA Explorer Schools teams, consisting of teachers and education administrators from diverse communities across the country.

For a list of NASA's first 50 Explorer Schools or information about NASA's Explorer Schools Program, visit the program's web site: <http://explorerschools.nasa.gov>.

## NASA program selects research and education projects

The NASA-sponsored Florida Space Grant Consortium (FSGC) at the University of Central Florida and the Florida Space Research Institute (FSRI) have selected 18 space research and education projects to receive over \$357,000 in grant awards. The grants combine federal and state funds for projects that support the expansion of Florida's space industry in areas including spaceport technology, space-based research and payload development, and space education and training.

"Strategic investments like these will improve Florida's research and education capabilities while promoting space industry diversifi-

cation," said Florida Lt. Governor Toni Jennings. "By leveraging state and NASA funding, the grant program supports our mutual interests in space technology development."

The approved projects will involve seven different universities, including Florida Institute of Technology, University of Central Florida and University of Florida, among others. NASA and multiple companies will also be involved in the grant projects.

The projects cover a variety of topics, including thermal protection for reusable launch vehicles, a Mars aerial reconnaissance vehicle and early education for space science.

# One NASA brings benefits to agency's astrobionics program

Biological and medical technologies across NASA are stronger now, thanks to a NASA-wide teaming effort called 'astrobionics.' The program develops new technology and hardware for space - and ground-based research, as well as providing the latest information about its work across the agency.

Astrobionics functions as an integrated program/project team providing a NASA-wide technology capability in support of NASA's Office of Biological and Physical Research. The NASA team brings people together to collaborate not only within NASA, but it also links NASA people with peers in other government agencies, academia and industry.

Astrobionics assists such key NASA programs as fundamental space biology, bioastronautics, astrobiology and biomolecular systems research.

"Particularly in biological technologies, there are a lot of commonalities that cross many disciplines at many NASA centers," said John Hines, manager of the astrobionics group at NASA's Ames Research Center. "Because many groups and areas can use the same technologies, and there are not enough resources to conduct all these activities, this 'OneNASA' effort facilitates teaming and leveraging while breaking down historical barriers that blocked collaboration among centers.

"We've created project teams to identify common technology needs across multiple programs and across multiple NASA centers," said Hines. "The scope of the program includes project management, technology and product definition, technology development and application."

The program presently includes participants at Ames, Johnson Space Center, Houston; the Jet Propulsion Laboratory, Pasadena, Calif. (JPL); and NASA Headquarters, Washington. In addition, discussions recently began about the future use of the astrobionics effort at Marshall Space Flight Center, Glenn Research Center and



John Hines, manager of the astrobionics group at NASA's Ames Research Center, helped create project teams to identify common technology needs across multiple programs and across multiple NASA centers. He believes the One NASA effort facilitates teaming while breaking down historical barriers.

Kennedy Space Center.

"A primary example of the OneNASA concept within astrobionics is the Biomolecular Systems Research Program (BSRP)," said Hines, who also is BSRP program manager. "BSRP is the agency's lead for research into molecular and nano-scale biological technologies and represents the NASA element of a collaboration between NASA and the National Cancer Institute. The program manager is at Ames. The deputy, Darrell Jan, is at JPL, and the enterprise scientist is at Headquarters. BSRP hopes to expand to support research at Johnson, Marshall and Glenn, in addition to Ames and JPL. Products resulting from the BSRP can be used in a variety of biological and medical applications."

To develop a particular technology, astrobionics works either entirely within NASA or with external partners. After researchers have decided that a potential technology has merit, astrobionics may develop working prototypes for testing.

Successful technologies then can be transitioned to flight and other applications hardware developers for final implementation. By its very nature, the astrobionics sequence of steps creates liaisons between programs and projects and supports the OneNASA concept. The collaborations that result can be helpful to all parties by provid-

ing cost sharing and other benefits.

Recently, astrobionics began a new project, the Technology Integration Agent (TIA). TIA helps researchers and managers to define requirements, assess potentially useful technologies and integrate them into ongoing and future projects. It has a database of its assessments for participating users.

TIA includes a team of scientists and technologists who find new technologies and know-how and decide if these could be useful in ongoing or future space efforts.

Astrobionics may build new hardware that scientists can use to conduct research during space flight. This hardware should be reliable, safe, automated and tailored to dovetail with the unique environments onboard spacecraft.

The effort could include a development cycle that starts at a requirements definition and goes step-by-step to final certification, documentation and testing.

For example, the astrobionics

team is developing advanced technologies to monitor astronaut health during space flight and ground tests. The monitoring program is called the Smart Healthcare Management System.

One of its systems, Lifeguard, measures human vital signs. It was recently delivered to Johnson Space Center for use during human tests in an underwater laboratory off the Florida coast.

The astrobionics group also is developing advanced, shoebox-sized biological payloads for use in small autonomous satellites that are part of the Fundamental Space Biology Program. Scientists intend to use these payloads for genetics studies of the effects of microgravity and space radiation on biological specimens such as yeast, various cells and nematodes.

"The interesting thing about these biological payloads is that you have to do all your analysis in space, and transmit data back to Earth because no samples will be returned," said Hines.

To foster collaborations outside of NASA, the astrobionics program uses a number of tools and procedures to carry out partnerships. To formalize cooperation with other government agencies, program participants use memoranda of understanding and agreements.

To work with industry, the program utilizes Space Act agreements and other kinds of agreements and contracts. To work with academia, the astrobionics team makes cooperative agreements, grants and contracts.

More information about the astrobionics program is on its web site at: <http://www.astrobionics.arc.nasa.gov>.

## KENNEDY (Continued from page 1)

called to active duty in the U.S. Air Force, he earned his master's degree in business administration from Georgia Southern University in 1977.

Kennedy has received numerous awards during his NASA career, including

Marshall's Leadership Award, NASA's Silver Snoopy Award, a Distinguished Service Medal and a Meritorious Rank Award. He also has received a Group Achievement Award and several Special Service and Performance Awards.



# Twin Mars Exploration Rover lifts off

NASA launched its second Mars Exploration Rover, Opportunity, on July 7 aboard a Delta II launch vehicle. Opportunity's dash to Mars began with liftoff at 11:18 p.m. EDT from Cape Canaveral Air Force Station.

The spacecraft separated successfully from the Delta's third stage 83 minutes later, after it had been boosted out of Earth orbit and onto a course toward

Mars. Flight controllers at NASA's Jet Propulsion Laboratory received a signal from Opportunity at 12:43 a.m. Tuesday EDT.

As of early Tuesday, July 8, Opportunity's twin, Spirit, has traveled 48 million miles since its launch on June 10 and is operating in good health.

Opportunity is scheduled to arrive at a site on Mars called

Meridiani Planum on Jan. 25, 2004, three weeks after Spirit lands in a giant crater about halfway around the planet. Both rovers will examine rocks and soil for clues about whether past environments at their landing sites may have been hospitable to life.

Visit <http://mars.jpl.nasa.gov/mer> for information about the mission.



Opportunity liftoff aboard a Delta II.

## 30 years ago: Explorer 49 used to measure solar radio noise

NASA launched the Explorer 49 satellite on June 10, 1973, from KSC using a three-stage Delta with nine solid motors on the first stage.

The second of two approved Radio Astronomy Explorer (RAE) missions, the satellite measured galactic and solar radio noise at frequencies where ionization caused by solar radiation affect the transmission of radio waves, using the moon for focusing or aperture blocking for increased resolution.

Scientists planned to use the satellite's occultations to pinpoint the source of signals more precisely as they appeared and disappeared on the moon's horizon during each orbit.

The main structure was a 36-inch cylinder with four fixed solar panels providing 38 watts of power to a nickel-cadmium battery with a capacity of six hours. Its most prominent feature was its four 750-foot booms which deployed in space to form a giant "X" radio antenna with

the spacecraft body at its center.

Other fixtures included a two-element, 120-foot long dipole antenna and a 675-foot boron libration damper boom.

The communication system included three transmitters and tape recorders. All these features contributed to Explorer 49 weighing 723 pounds at launch.

On June 20, the dipole antenna was extended by ground control and the experiment turned on. After a two-week calibration, the dipole was retracted and the orbit adjusted as needed.

The two main "V" antennas, joined in an "X" shape, were then deployed to 600 feet. After another week, the V antennas were deployed to their full length to achieve the mission's gravity-gradient, three-axis stabilization mode.

The spacecraft was the first to use boron filament for the inertial booms that helped stabilize it during the lunar trajectory.

## Remembering Our Heritage



The Explorer 49 satellite launched on June 10, 1973, from KSC using a three-stage Delta with nine solid motors on the first stage.

## Three Toastmaster Clubs offered at KSC

Kennedy Space Center hosts three Toastmasters clubs, including KSC Toastmasters, Alpha Toastmasters and LC-39 Toastmasters. The clubs provide formal training to NASA and contractor employees, leading to improved speaking and leadership skills that are applied both in the workplace and the community.

Toastmasters meetings include practice in prepared and impromptu speaking, friendly, constructive speech evaluations, and formal training in speaking

and evaluation techniques.

KSC Toastmasters meet weekly in HQ 2201 at 11:30 for one hour. Meetings usually feature one or two prepared five to seven-minute speeches with formal two to three-minute evaluations, and several one to two minute impromptu speeches called "Table Topics."

KSC Toastmasters are rated 'President's Distinguished' by Toastmasters International for the fourth straight year. This is the highest honor a club can obtain.



John F. Kennedy Space Center

## Spaceport News

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Managing editor. . . . . Bruce Buckingham  
Editor. . . . . Jeff Stuckey

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